Original Article

Clinical Profiling of a Bilingual Client with Anomic Aphasia

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Abstract

Background: Aphasia is an acquired condition affecting auditory comprehension, verbal expression, reading, writing and word-finding abilities along with sensory-motor impairments. Anomia refers to difficulty in word retrieval or naming which is seen irrespective of the type of aphasia. However, if a patient shows word-finding difficulty, in specific, a diagnosis of Anomic aphasia is made. There are variations within anomic aphasia on which the management and recovery depend. The article provides one such case report.
Purpose: Speech and language profiling in anomic aphasia, specific treatment strategies, the effect of bilingualism on recovery.
Methods: Mr S, a 38-year-old bilingual male reported 5 months post-stroke with difficulty in expressing, difficulty in writing and weakness in the right side of the body. Medical history was checked and speech and language evaluations including both formal and informal assessments were performed. After this, a diagnosis of Anomic aphasia with mild dysarthria was made. An appropriate speech–language therapeutic plan and specific activities were formulated for Mr S in his first language (L1) and he was given a therapy for a span of 3 months. A follow-up evaluation in both first and second language of the patient yielded differential recovery patterns.
Results: The diagnosis was affected by different variants of anomic aphasia; treatment was specific to the clinical profiling and followed life-participation approach of aphasia. The recovery was affected by differential recovery patterns between the languages.
Discussion: Factors pertaining to diagnosis, recovery, bilingualism and treatment of the client with anomic aphasia are discussed.

Keywords

Anomic aphasia variants, residual aphasia, bilingualism, therapy, recovery

Introduction

Aphasia refers to the disturbance of any or all of the skills, associations and habits of spoken and written language produced by injury to certain brain areas that are specialized for these functions. Disturbances in communication that are because of paralysis or incoordination of the musculature of speech or writing, or because of impaired vision or hearing, are not, of themselves, aphasic.

> *Thus, aphasia can affect auditory comprehension, verbal expression, reading, writing, and word-finding abilities.*[1]

A number of classification systems are available to describe the various language impairments of aphasia. One of the most influential classification systems was proposed by Goodglass[2] and modified by Davis.[3] Aphasia is broadly classified as fluent and non-fluent type. Non-fluent aphasia is characterized by

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faltering and effortful speech: impaired grammar, although content words are preserved in the speech. Further, there are 3 major varieties under the non-fluent type such as (a) *Broca's Aphasia*: poor in repetition of words/phrases, (b) *Transcortical Motor Aphasia*: exhibits strong repetition skills; may have poor spontaneous speech, (c) *Global Aphasia*: severe impairment in expressive and receptive language; may use facial expressions and gestures to communicate.[4] Fluent type is characterized by empty/meaningless speech and deficits in comprehension. Further there are four major varieties under the fluent type such as (a) *conduction aphasia*: poor word-finding abilities; impaired repetition, (b) *anomic aphasia (AA)*: good repetition skills; difficulty in word retrieval; uses common fillers (e.g., "thing") or circumlocution, (c) *Wernicke's aphasia*: poor repetition skills, (d) *transcortical sensory aphasia*: good repetition of words/phrases; exhibits echolalia.[4]

Here, Broca's aphasia, transcortical motor aphasia, conduction aphasia and AA are the variants with relatively intact language comprehension, whereas in global aphasia, Wernicke's aphasia and transcortical sensory aphasia, language comprehension is affected. Let us consider AA in specific here as the case report discussed ahead is a case of AA. AA can be considered the mildest form of aphasia when compared to all the other types. Persons with AA would represent with relatively spared spontaneous speech, comprehension, and repetition, and may have difficulty in word finding or lexical access. Anomia in its literal sense refers to 'without names' and is a symptom seen in all forms of aphasia. However, when a patient exhibits word-retrieval difficulty as a primary language dysfunction, AA is diagnosed.

Many standardized language assessment tests are used for diagnosis and categorization of aphasia. Western Aphasia Battery (WAB)[5] is one of the most common, widely used, culturally accepted and standardized test which is available in different languages for aphasia. It has high test–retest reliability along with high sensitivity to measure the severity of language impairments in brain-damaged individuals between 18 and 89 years of age.[6,7] A cumulative score of four sections of the test, namely (a) spontaneous speech, (b) auditory verbal comprehension, (c) repetition and (d) naming provides the aphasia quotient (AQ), which is a representation of the severity and type of aphasia; the maximum value achieved for this quotient is 100. Any score less than 93.8 is categorized as aphasia and any score above 93.8 is considered non-aphasia as per the norms. Based on the scores, classification of the type of aphasia can be done. The test can be further used to profile the language deficits in persons with aphasia qualitatively. Profiling of language deficits in terms of the effect of word retrieval, discourse and pragmatics could better represent the condition. Therefore, these details may better enable the speech–language therapist to choose goals during therapy.

Considering that most of the individuals in the current society are bilinguals, language profiling has to be carried out in all the languages known. The word-retrieval deficits may vary across languages and word class.[8] However, contradictory findings also have been documented.[9] The former study was carried out with the dominant language of the bilingual patient, while the latter was carried out with both the languages known to the person.[8,9] A dissociation was noticed between the two languages in terms of word class. The literature has highlighted language profiling in persons with AA in terms of word retrieval and recovery in bilinguals. Naming nouns and verbs in persons with bilingual AA (Greek as a first language and English as a second language) were observed to be language dependent.[10] Further, the patterns of naming and its interaction with word class in a person with bilingual AA (Chinese and Mandarin) were examined. This showed an effect on the recovery patterns in both languages in terms of word class.[11] Thus, the findings highlighted the importance of profiling word-retrieval abilities in both the languages and planning differential therapeutic plan in a person with AA.

The earlier reports were limited to the tracking patterns of recovery and its relation to word retrieval in bilingual aphasia. However, profiling bilingual aphasia in terms of recovery patterns in both languages to cater to the therapeutic needs was sensed. Thus, the present study aimed to highlight the importance of diagnosis and profiling the language characteristics, and trace the recovery pattern with regard to both languages and therapeutic goals concerning the life-participation approach and the quality of life.

Methods

Participant Details

Mr S, 38-year-old male, reported difficulty in expressing, difficulty in writing and weakness in the right side of the body. The patient reported these 5 months after stroke. The patient is an MBA graduate who worked as a sales executive and is a Kannada– English bilingual.

Medical History

The medical findings revealed no speech output immediately post-stroke with high blood pressure at the time of admission and right hemiparesis. The radiological findings (MRI reported cerebro vascular accident: right hemiplegic + hypertensive + left putaminal intracerebral haemorrhage + left ganglionic haematoma. Further, the report read hyperdense lesion measuring 5.1 × 1.8 cm in the left ganglio-capsulonic area with effacement of ipsilateral ventricle and adjacent minimal edema. Rest of the supratentorial brain parenchyma, cerebellum and brainstem showed normal attenuation. Scalp, extra-axial spaces and calvarium were normal. Interhemispheric fissure was in midline and no evidence of fracture was seen. With this medical history and complaint, the patient was referred to undergo speech and language evaluation, physiotherapy/occupational therapy evaluation and neurological evaluation.

Evaluations

During the informal evaluation in speech–language out patient department (OPD), the following observation was made by the clinician: Mr S was able to give relevant answers to the questions asked, he could narrate events and use complete sentences to answer the questions, his speech was unclear and inappropriate pauses were observed and he could follow 3-step commands and general conversation. Oral motor examination revealed structurally normal structures with affected lip retraction and protrusion range, affected lip seal and deviation of the tongue to the right side of protrusion.

Mr S was administered WAB-K (Kannada version)[12] and an AQ of 89.2 was derived. Mr S performed relatively low in naming domain (86 on 100) as compared to all other domains of WAB (spontaneous speech, 17 on 20; auditory verbal comprehension, 196 on 200; repetition, 92 on 100; see Table 1). Thus, Mr S was diagnosed with AA based on the scores.

Further, Frenchay Dysarthria Assessment (FDA)[13] was administered as slurring of speech was noted along with compromised speech mechanism. FDA is a test to quantitatively assess the functioning of the speech subsystems (respiratory system, phonatory system, resonatory system and articulatory system) and speech intelligibility. The results are represented graphically by shading the specific subsection based on the performance of the patient on the task. Shading is done to indicate the severity of dysarthria (higher the shading, better is the performance). On FDA, Mr S showed slightly affected lip, jaw, laryngeal and tongue functions which explained his slurring (see Figure 1). Additionally, slight deviation of lips towards right and reduced sensation on right oral and facial structures was noted. Thus, Mr S was diagnosed with mild dysarthria based on FDA. Alongside the physiotherapist made an impression of post-stroke writing difficulty and recommended for therapy. Overall, Mr S received a diagnosis of AA with mild dysarthria at the speech–language OPD.

Table 1. Pre-therapy WAB Scores (WAB as on 12 August 2015 in the First Visit)

WAB Domains	Max Score	Patient Score	Total for AQ
Spontaneous speech			
Information content	10	8	
Fluency	10	9	17
Comprehension			
Yes/no question	60	60	
Auditory word recognition	60	60	9.8
Sequential commands	80	76	
Repetition	100	92	9.2
Naming			
Objective naming	60	60	
Word fluency	20	8	8.6
Sentence completion	10	8	
Responsive speech	10	10	
Aphasia quotient			89.2

Source: Authors' interpretation based on the performance on Frenchay dysarthria assessment (FDA) and Western aphasia battery (WAB).

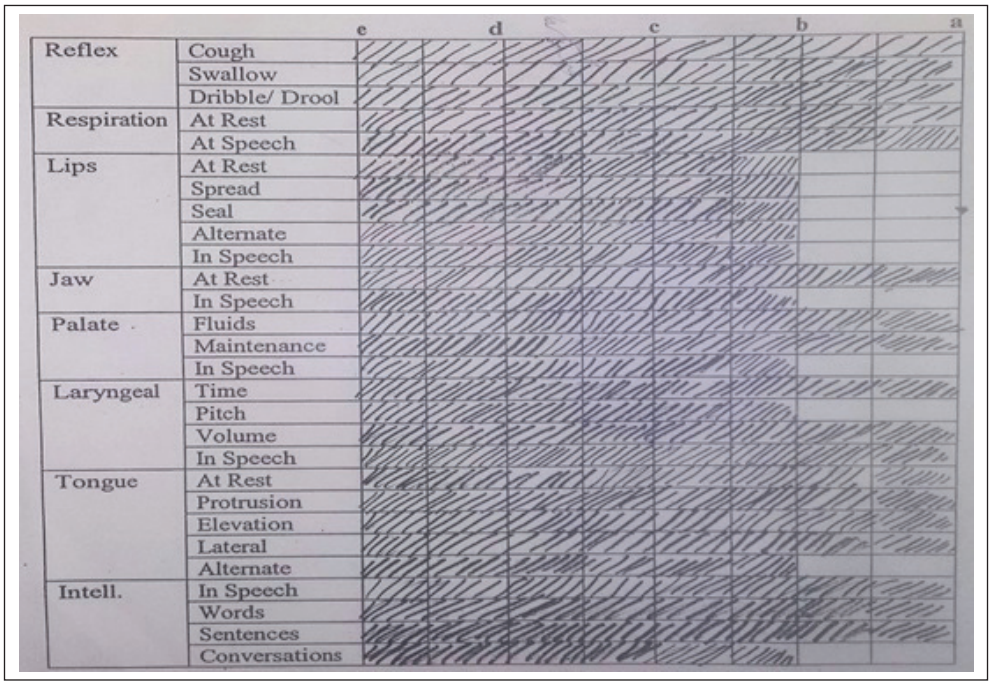

Figure 1. Pre-therapy Graphical Report of FDA (Administered as on 12 August 2015)

Source: Authors' interpretation based on the performance on Frenchay dysarthria assessment (FDA) and Western aphasia battery (WAB).

Discourse and word retrieval were used as speech samples to profile the language of Mr S because the repetition of longer sentences and word naming were difficult. Discourse sample revealed word-retrieval issues (difficulty in finding and selecting words), code-mixing (alternating between languages), syntactic errors (grammatically poor sentence structure and reduced sentence length), phonemic paraphasias (preserves at least a part of the intended word by substituting incorrect phonemes to form a non-word), circumlocutions (beating around the bush), hesitations, word-finding pauses and compromised speech intelligibility. Naming abilities revealed failed phoneme fluency (naming words beginning with a specified phoneme/letter stimulus) and compromised word fluency (naming words within a specified category). However, confrontation naming (naming the picture or object shown on request) and responsive naming (naming in response to an idea during conversation) were spared.

Management

A consolidated therapy plan focusing on combating all the issues was made and the therapy was started. The speech and language therapy was provided in Kannada, the patient's first language (L1), for 3 months though the patient was a Kannada–English bilingual. The reasons behind were Kannada being the mother tongue, frequency of L1 being more in home and work environment, immediate and primary exposure to Kannada post-stroke and also the patient was found to be a successive bilingual, wherein he was exposed to English as his second language (L2) only during his middle school years. The therapy plan was made with the following goals: (a) to improve oro-motor skills, (b) to improve linguistic skills (repetition abilities, lexical generative naming, discourse and articulatory precision), (c) to improve cognitive-linguistic skills (immediate memory, recent memory, conceptual relationships and associations, organization and categorization), (d) to promote literacy skills (reading comprehension and writing). The specific goals taken up under the broad goals and the progress made in both L1 and L2 by Mr S is discussed further.

The clinician had taken up tailor-made and specific activities such as to promote symmetry of lip closure at rest and during movement, strengthen the lips, improve lip seal and intra-oral breath pressure under oro-motor domain. Mr S was able to achieve 95% accuracy for lip symmetry and improved in terms of speed, range and accuracy. This was achieved with the use of both isotonic and isometric exercises. Mr S was also able to maintain intra-oral pressure for non-speech activities and plosives. Thus, sufficient improvements in the oral motor abilities promoted better clarity in speech and reduced slurring of speech in Mr S.

Further, under the linguistic domain, specific goals such as the following were taken up: to improve comprehension and expression at the discourse level through picture description, narration and spontaneous speech up to > 90% and lexical-generative naming abilities (phoneme fluency) to 80% level, and to promote articulatory precision of Mr S's speech. Mr S was able to perform on discourse tasks using Semantic Feature Approach and Response Elaboration Technique with an accuracy of 96% in Kannada and 80% in English. The progress was well appreciated when compared to his baseline measures. Mr S was able to perform on naming tasks with an accuracy of 90% in Kannada and 75% to 80% in English, again indicating good progress. Articulation was achieved with consistency of 9/10 trials and accuracy of 95% in all levels (isolation, word and sentence) for the distorted phonemes.

The clinician had taken up the literacy skills wherein sentence completion, sentence construction and sentence sequencing were worked upon to improve both reading and writing. There was sufficient improvement of up to 90% in Kannada and 80% in English. However, legibility remained poor in both languages. Mr S was also stimulated to promote cognitive-linguistic skills with a variety of tailor-made activities. With this, Mr S showed progress in terms of immediate memory, recent memory, conceptual relationships and associations, organization and categorization.

Follow-up evaluation was made 3 months post-intensive speech and language therapy which involved re-administration of WAB, FDA and other naming tests. WAB was done in both L1 (Kannada) and L2 (English) for the patient. In L1 Mr S's post-therapy scores on various domains were as follows: spontaneous speech (19/20), auditory verbal comprehension (200/200), repetition (94/100) and naming (95/100), yielding an AQ score of 95.8 (see Table 2). There was a 10% improvement in the spontaneous speech domain, 2% improvement each in the auditory–verbal comprehension and repetition domain and 9% improvement in the naming domain. Thus, an obvious improvement in terms of AQ (95.8) was noticed when compared to baseline AQ (89.2). Further, in L2 Mr S's post-therapy scores were: spontaneous speech (17/20), auditory–verbal comprehension (192/200), repetition (86/100) and naming (85/100), yielding an AQ score of 87.7 (see Table 2), therefore, indicating an improvement in AQ scores in only L1 in which the therapy was provided but not in Mr S's L2.

Considering the AQ scores were depicted in WAB for L1 and L2, it is evident that the scores are better in L1 than L2. The speech and language therapy provided in L1 for 3 months had resulted in improvements in the specific language alone. FDA was also administered post-therapy which revealed no dysarthric component (see Figure 2). A skilled observer could make out the slight deviation of upper and lower lips of Mr S. Further, naming assessments in terms of retrieval of nouns, retrieval of verbs and semantic fluency were carried out to estimate the progress. From the naming assessments it was evidenced that there was significant progress in naming skills in L1 but not in L2. Thus, with these post-therapy evaluations, a diagnosis of non-aphasia in L1 and AA in L2 were made. It was also noted that Mr S progressed with respect to his mood and showed controlled emotions, though not treated directly.

Table 2. Post-therapy WAB Scores on L1 and L2

WAB Domains	Max Score	Kannada	AQ	English	AQ
Spontaneous speech					
Information content	10	10		9	
Fluency	10	9	19	8	17
Comprehension					
Yes/no question	60	60		60	
AWR	60	60	10	56	9.75
Sequential commands	80	80		76	
Repetition					
	100	94	9 9.4	86	8.6
Naming					
Objective naming	60	60		56	
Word fluency	20	17		9	
Sentence completion	10	8	90.5	10	8.5
Responsive speech	10	10		10	
Aphasia quotient			95.8		87.7

Source: Authors' interpretation based on the performance on Frenchay dysarthria assessment (FDA) and Western aphasia battery (WAB).

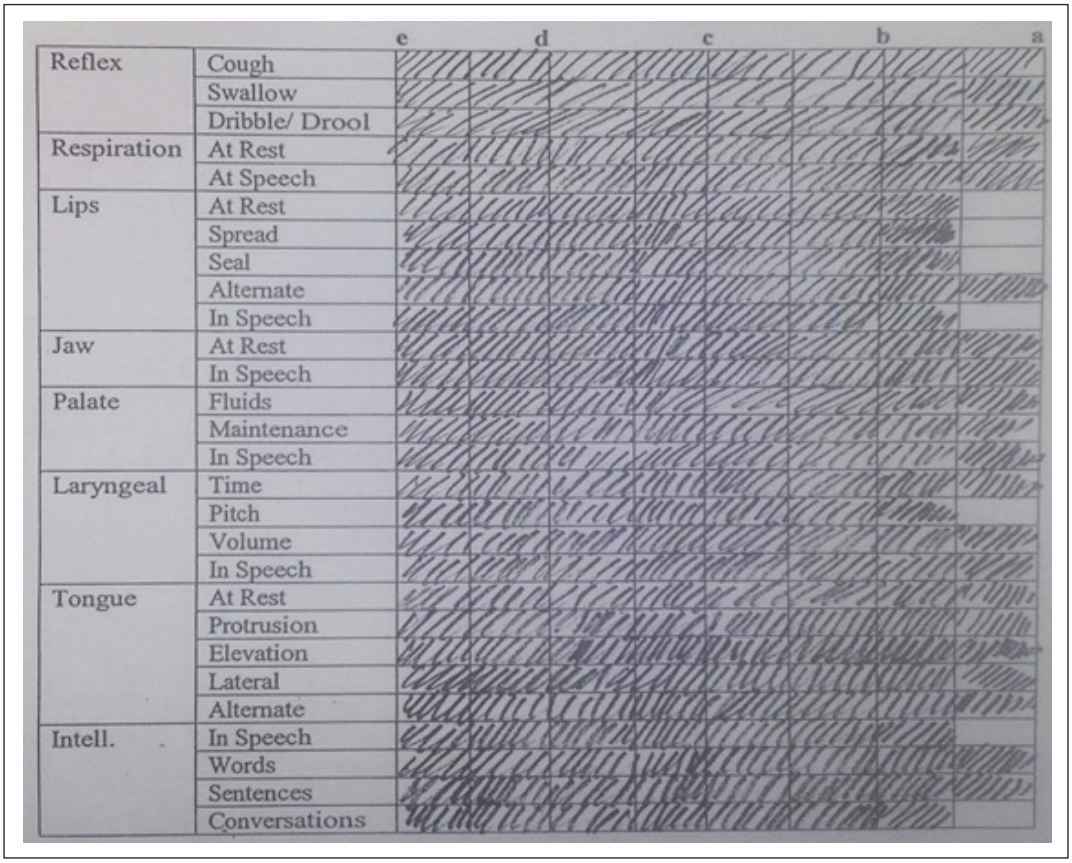

Figure 2. Post-therapy Graphical Report of FDA (Administered on 15 November 2015)

Source: Authors' interpretation based on the performance on Frenchay dysarthria assessment (FDA) and Western aphasia battery (WAB).

In summary, Mr S had a stroke on 18 March 2015 and reported to our institute on 12 August 2015, wherein pre-therapy and baseline evaluations were done to yield a diagnosis of AA with mild dysarthria. Speech and language therapy was provided for a duration of 4 months between 17 August 2015 and 27 December 2015. Further, detailed post-therapy evaluations were conducted on 15 November 2015 which yielded a diagnosis of AA only in L2. Thus, a

differential recovery pattern has been noticed between the languages (L1 and L2). The major clinical issues encountered in the patient during diagnosis, recovery and treatment were as follows: the diagnosis was affected by different variants of AA, recovery in terms of differential recovery patterns between the languages and treatment in terms of adequacy of goals taken up.

Discussion

AA has two variants theoretically, that is, primary and secondary variants. The primary variant usually caused post-stroke due to damage to a parietal–temporal junction or angular gyrus. A person with primary variant is supposed to have deficits in word selection and the language output and would have predominant paraphasia. The response to treatment is relatively slow. The secondary variant manifests as global or Broca's aphasia at the acute stage which may resolve to conduction aphasia initially and AA eventually. In this context, aphasia itself may be mild in nature and greater difficulty is seen in different tasks which impose relatively more cognitive-linguistic load. The responsiveness to treatment is relatively quick. Based on this, our patient showed features favouring the secondary variant of AA. Further, Mr S had problems related to expression before reporting to us. It is speculated that Mr S would have progressed from non-fluent to anomic because of micro/macro levels of recovery. He had lesser problems on confrontation naming but had greater word-retrieval deficits at higher levels of language, such as discourse. The language output was not embedded with paraphasia and he benefited with all types of cues. This finding is unlikely in accordance with the literature, which shows that 78% of persons with AA do well with semantic cues. Another evidence suggesting secondary variant is the presence of dysarthria which studies have reported to be associated with Broca's aphasia. Further, we speculate with evidence in the literature that the stimulating and facilitating environment would have led to progression from non-fluent to AA, leaving the dysarthric component to be persisting in its mild form. Again, proving to be the secondary variant of AA.

Another consideration is residual aphasia, an intermediate or transitory stage between aphasia and non-aphasia. Residual aphasia refers to the disturbance in which the person may be able to converse yet have subtle deficits in finding the right word or providing information density or understanding complex conversation.[14] The term residual aphasia is often governed by operational definitions given by researchers/authors and can be confirmed only by Aachen aphasia test.[15] Our clinical situation does not allow the diagnosis of residual aphasia and is not accounted on WAB. However, we analyzed the features presented by Mr S such as intact information content (evidenced by score on information content of WAB section), appropriate use of content words, good lexical diversity (evidenced by performance on naming assessments), adequate coherence between words, sentences and within a topic with affected spontaneous speech. The features did not support the diagnosis of residual aphasia, though a formal test currently is not possible to rule out the diagnosis.

Yet another consideration in the diagnosis was aphasia in L2 and non-aphasia in L1. Literature has provided several pieces of evidence which can be considered. A bilingual is a person who poses some amount of competence in his/her second language. There could be variations within bilingualism in terms of acquisition, i.e., (a) simultaneous bilingualism: both languages acquired simultaneously since birth wherein the individual probably would have equal dominance over both the languages and (b) sequential bilingualism: L1 is learnt earlier compared to L2 wherein the individual probably would have dominance over L1 compared to his/her L2. If a person was a dominant bilingual pre-morbidly, he has to be diagnosed on the basis of language deficits in the dominant language or on the results of a standardized test battery carried out in the dominant language. If the person is a balanced bilingual, aphasia can be diagnosed if the AQ is lesser than the stipulated value in any of the 2 languages. The other determinants are social use, predominately used language, etc., all of which indicate to L1 (Kannada) in the present case. As these conditions are satisfied, the case can be a diagnostic label of non-aphasia.

The second clinical issue encountered was a recovery pattern. Literature has reported various recovery patterns such as parallel recovery, selective recovery and pathological mixing of two languages.[16] Recovery patterns in bilingual aphasia involve selective recovery of any one language, parallel recovery of both languages and antagonistic recovery of one language by interfering with another language or alternate antagonistic recovery of selective difficulty in comprehension and production across the 2 languages.[17] A case study on a bilingual person with aphasia reported parallel pattern of recovery, and also the importance of using both formal and informal assessment tools to track the progress.[18] Let us consider the patient's performance in L1 and L2 to check which of the patterns of recovery was followed. Mr S performed equally well in both L1 and L2 in domains such as noun and verb naming and repetition. In domains such as spontaneous speech, narration and picture description, he performed relatively better in L1 than L2. It can be speculated that there could be factors influencing the pattern of recovery such as the order of acquisition of languages, structural distances between languages, proficiency in one language, language used in therapeutic intervention and the environment. Overall, Mr S showed a better recovery in first language than second language (later learned language) in all the aspects of language indicating a differential recovery pattern in L1 and L2. This is supported by the hypothesis of differential reliance on declarative memory, it can be expected that older the patient, the recently learned language is more likely to be affected.[19]

The last clinical issue was the adequacy of therapeutic goals taken up. The therapeutic plan made was based on the considerations of language profile and to maximize quality of life and communication success of Mr S. The therapeutic goals taken up were effective and it was evident from the progress seen. The goals taken up were (a) restoring language abilities, (b) training family and caregivers, (c) generalization of skills and strategies, (d) strengthening intact modalities and behaviours, (e) educating persons with aphasia, (f) cognitive and linguistic goals, (g) bilingual considerations and (h) effect of environment. These goals were based on 'Life Participation Approach to Aphasia' (LPAA). LPAA is a 'consumer-driven service-delivery approach that supports individuals with aphasia and others affected by it in achieving their immediate and long-term life goals'.[20] The major consideration of LPAA is to focus on the real-life goals, establishing the requisites in addition to the residual skills, activity execution based on the individual's preference and interest, and consideration of the dual function of communication. Thus, the considered goals met all the criteria of LPAA and showed sufficient progress in the patient.

Conclusion

The language characteristics of a bilingual patient with AA were profiled in both languages. Adequate goals to foster the patient's life participation were chosen based on LPAA in accordance with the language profile. It was observed that Mr S showed differential recovery pattern in both languages, wherein he performed better in first language in comparison to the second. This finding was attributed to various factors such as variants of AA, bilingualism and the therapy approach which focussed on the quality of life. Thus, the importance of considering the possible factors that could affect the process of diagnosis and therapeutics is highlighted in this case study.

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Author Contributions

M.N. was responsible for data collection and for drafting the manuscript, H. S. D. participated in data collection and edited the manuscript, B. P. A. guided throughout the development of the manuscript and also contributed towards the discussion and editing of the manuscript, and S. P. G. supervised and was responsible for proofreading of the manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical Statement

Procedures of the present study were duly approved by AIISH Ethics Committee, All India Institute of Speech and Hearing, Mysore, Karnataka, India.

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